

PATENT COOPERATION TREATY

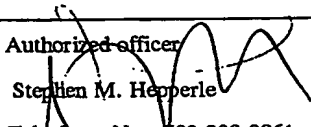
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REC'D 23 DEC 2004

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

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(PCT Article 36 and Rule 70)

Applicant's or agent's file reference LEG030319PCT		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US03/38989	International filing date (day/month/year) 09 December 2003 (09.12.2003)	Priority date (day/month/year) 09 December 2002 (09.12.2002)	
International Patent Classification (IPC) or national classification and IPC IPC(7): G05D 16/06; F16K 11/14 and US Cl.: 137/505, 505.12, 505.46, 606, 607			
Applicant S. H. LEGGITT COMPANY			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>8</u> sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of report with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 17 June 2004 (17.06.2004)		Date of completion of this report 01 December 2004 (01.12.2004)	
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer  Stephen M. Hepperle Telephone No. 703-308-0861	

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

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I. Basis of the report**1. With regard to the elements of the international application:***

- ☐ the international application as originally filed.
- ☒ the description:
pages 1-8 as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☒ the claims:
pages NONE, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages 9-16, filed with the letter of 07 October 2004 (07.10.2004)
- ☒ the drawings:
pages 1-6, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☐ the sequence listing part of the description:
pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☒ the claims, Nos. 1
- ☐ the drawings, sheets/fig NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/38989**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

Novelty (N)	Claims <u>2-27</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>4-7, 10-12, 14-27</u>	YES
	Claims <u>2-3, 8-9, 13</u>	NO
Industrial Applicability (IA)	Claims <u>2-27</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Claims 2, 3, 8, 9 and 13 lack an inventive step under PCT Article 33(3) as being obvious over EVANS in view of CARTER. It would not have involved an inventive step to supplement or replace the Evert spring guides 116 with cup shaped stabilizers as shown by Carter (554, 754) because of the equivalence of the two structural arrangements.

Claims 4-7, 10-12, and 14-27 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a regulator with two inlets using a diaphragm with sleeves for receiving stabilizing cups, or where each cup has a stop or a plate with apertures surrounding the bias springs.

Claims 2-27 meet the criteria set out in PCT Article 33(4) because the subject matter claimed can be made or used in industry.

----- NEW CITATIONS -----

NONE

I claim:

1. Canceled.

2. A pressure regulator comprising:

a housing having an interior space, at least one input into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through the at least one input and exit the interior space through the output;

a closure member for each input, the closure member selectively covering an associated one of the at least one input for preventing fluid flow into the interior space of the housing;

a diaphragm in the housing, the diaphragm being interconnected to the closure member;

a biasing member for each closure member, the biasing member configured to selectively bias the closure member away from the associated one of the at least one input to allow fluid flow through the input;

wherein the diaphragm is configured to move against the biasing member when pressure in the interior space is above a predetermined amount, whereby the closure member will move in response to movement of the diaphragm to close the at least one input such that fluid is not able to pass into the interior space through the input; and

a stabilizing member in the housing, the stabilizing member surrounding the biasing member for maintaining the biasing member in position.;

wherein the at least one input comprises two inputs.

3. The pressure regulator of claim 2, wherein:

the stabilizing member comprises a cup surrounding a bottom of each biasing member.

4. The pressure regulator of claim 3, wherein:

the diaphragm includes a sleeve for each cup for accepting the cup therein, whereby the cup is located between the biasing member and the diaphragm.

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5. The pressure regulator of claim 4, wherein:

the sleeves include a rolling receiver portion; and

the diaphragm includes a substantially flat surface portion surrounding the sleeve, whereby the rolling receiver portion can move with movement of the cup without substantially moving the substantially flat surface portion.

6. The pressure regulator of claim 4, further including:

a stop for each cup, the stop being located within the housing, the stop configured to abut against a top of the cup to prevent upward movement of the cup past the stop.

7. The pressure regulator of claim 2, wherein:

the stabilizing member comprises a plate having a pair of apertures therein, each aperture surrounding one of the biasing members.

8. The pressure regulator of claim 2, wherein:

the housing includes a changeover knob selectively interconnected to one of the closure members, the changeover knob having a first position aligned with a first one of the closure members and a second position aligned with a second one of the closure members;

when the changeover knob is in the first position and the pressure is below the predetermined amount, the first one of the closure members will not cover a first one of the inlets; and

when the changeover knob is in the second position and the pressure is below the predetermined amount, the second one of the closure members will not cover a second one of the inlets.

9. A pressure regulator comprising:

a housing having an interior space, two inputs into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through at least one of the two inputs and exit the interior space through the output;

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a pair of closure members, each closure member selectively covering an associated one of the two inputs for preventing fluid flow into the interior space of the housing through the associated one of the two inputs;

5 a diaphragm in the housing, the diaphragm being interconnected to each closure member;

a pair of biasing members, each biasing member configured to selectively bias one of the closure members away from the associated one of the two inputs to allow fluid flow through the associated one of the two inputs;

10 wherein the diaphragm is configured to move against the biasing members when pressure in the interior space is above a predetermined amount, whereby the closure members will move in response to movement of the diaphragm to close the inputs such that fluid is not able to pass into the interior space through the inputs; and

a pair of cups, each cup surrounding a bottom of one of the biasing members for maintaining the biasing members in position.

15 10. The pressure regulator of claim 9, wherein:

the diaphragm includes a sleeve for each cup for accepting the cup therein, whereby the cup is located between the biasing members and the diaphragm.

11. The pressure regulator of claim 10, wherein:

each sleeve includes a rolling receiver portion; and

the diaphragm includes a substantially flat surface portion surrounding each sleeve, whereby the rolling receiver portions can move with movement of the cup without substantially moving the substantially flat surface portion.

25 12. The pressure regulator of claim 11, further including:

a stop for each cup, the stop being located within the housing, the stop configured to abut against a top of the cup to prevent upward movement of the cup past the stop.

30 13. The pressure regulator of claim 9, wherein:

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the housing includes a changeover knob selectively interconnected to one of the closure members, the changeover knob having a first position aligned with a first one of the closure members and a second position aligned with a second one of the closure members;

5 when the changeover knob is in the first position and the pressure is below the predetermined amount, the first one of the closure members will not cover a first one of the inlets; and

when the changeover knob is in the second position and the pressure is below the predetermined amount, the second one of the closure members will not cover a second one of the inlets.

10

14. A pressure regulator comprising:

a housing having an interior space, two inputs into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through at least one of the two inputs and exit the interior space through the output;

15

a pair of closure members, each closure member selectively covering an associated one of the two inputs for preventing fluid flow into the interior space of the housing through the associated one of the two inputs;

a diaphragm in the housing, the diaphragm being interconnected to each closure member;

a pair of biasing members, each biasing member configured to selectively bias one of the closure members away from the associated one of the two inputs to allow fluid flow through the associated one of the two inputs;

25

wherein the diaphragm is configured to move against the biasing members when pressure in the interior space is above a predetermined amount, whereby the closure members will move in response to movement of the diaphragm to close the inputs such that fluid is not able to pass into the interior space through the inputs; and

a plate having a pair of apertures therein, each aperture surrounding one of the biasing members for maintaining the biasing members in position.

30

15. The pressure regulator of claim 14, wherein:

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the housing includes a changeover knob selectively interconnected to one of the closure members, the changeover knob having a first position aligned with a first one of the closure members and a second position aligned with a second one of the closure members;

5 when the changeover knob is in the first position and the pressure is below the predetermined amount, the first one of the closure members will not cover a first one of the inlets; and

when the changeover knob is in the second position and the pressure is below the predetermined amount, the second one of the closure members will not cover a second one of the inlets.

10 16. A pressure regulator comprising:

a housing having an interior space, at least one input into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through the at least one input and exit the interior space through the output;

15 a closure member for each input, the closure member selectively covering an associated one of the at least one input for preventing fluid flow into the interior space of the housing;

a diaphragm in the housing, the diaphragm being interconnected to the closure member; and

a biasing member for each closure member, the biasing member configured to selectively bias the closure member away from the associated one of the at least one input to allow fluid flow through the input;

25 wherein the diaphragm is configured to move against the biasing member when pressure in the interior space is above a predetermined amount, whereby the closure member will move in response to movement of the diaphragm to close the at least one input such that fluid is not able to pass into the interior space through the input; and

30 wherein the diaphragm includes a pair of sleeves, each sleeve having a rolling receiver portion and the diaphragm includes a substantially flat surface portion surrounding the sleeve, whereby the rolling receiver portion can move with movement

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of the biasing member without substantially moving the substantially flat surface portion.

17. The pressure regulator of claim 16, further including:

a stabilizing member in the housing, the stabilizing member surrounding the biasing members for maintaining the biasing members in position.

18. The pressure regulator of claim 17, wherein:

the stabilizing member comprises a cup surrounding a bottom of each biasing member.

19. The pressure regulator of claim 18, wherein:

each sleeve of the diaphragm includes one cup therein, whereby the cup is located between the biasing member and the diaphragm.

20. The pressure regulator of claim 18, further including:

a stop for each cup, the stop being located within the housing, the stop configured to abut against a top of the cup to prevent upward movement of the cup past the stop.

21. The pressure regulator of claim 16, wherein:

the housing includes a changeover knob selectively interconnected to one of the closure members, the changeover knob having a first position aligned with a first one of the closure members and a second position aligned with a second one of the closure members;

when the changeover knob is in the first position and the pressure is below the predetermined amount, the first one of the closure members will not cover a first one of the inlets; and

when the changeover knob is in the second position and the pressure is below the predetermined amount, the second one of the closure members will not cover a second one of the inlets.

22. A pressure regulator comprising:

a housing having an interior space, at least one input into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through the at least one input and exit the interior space through the output;

a closure member for each input, the closure member selectively covering an associated one of the at least one input for preventing fluid flow into the interior space of the housing;

a diaphragm in the housing, the diaphragm being interconnected to the closure member;

a biasing member for each closure member, the biasing member configured to selectively bias the closure member away from the associated one of the at least one input to allow fluid flow through the input;

wherein the diaphragm is configured to move against the biasing member when pressure in the interior space is above a predetermined amount, whereby the closure member will move in response to movement of the diaphragm to close the at least one input such that fluid is not able to pass into the interior space through the input; and

a stabilizing member in the housing, the stabilizing member surrounding the biasing member for maintaining the biasing member in position; and

a stop for the stabilizing member, the stop being located within the housing, the stop configured to abut against a top of the stabilizing member to prevent upward movement of the stabilizing member past the stop.

23. A pressure regulator comprising:

a housing having an interior space, at least one input into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through the at least one input and exit the interior space through the output;

a closure member for each input, the closure member selectively covering an associated one of the at least one input for preventing fluid flow into the interior space of the housing;

a diaphragm in the housing, the diaphragm being interconnected to the closure member;

5 a biasing member for each closure member, the biasing member configured to selectively bias the closure member away from the associated one of the at least one input to allow fluid flow through the input;

wherein the diaphragm is configured to move against the biasing member when pressure in the interior space is above a predetermined amount, whereby the closure member will move in response to movement of the diaphragm to close the at least one input such that fluid is not able to pass into the interior space through the input; and

10 a stabilizing member in the housing, the stabilizing member surrounding the biasing member for maintaining the biasing member in position;

wherein the stabilizing member comprises a plate having a pair of apertures therein, each aperture surrounding one of the biasing members.

15 24. The pressure regulator of claim 9, further including:

a stop being located within the housing, the stop configured to abut against a top of the cups to prevent upward movement of the cups past the stop.

20 25. The pressure regulator of claim 18, further including:

a stop for the stabilizing member, the stop being located within the housing, the stop configured to abut against a top of the stabilizing member to prevent upward movement of the stabilizing member past the stop.

26. The pressure regulator of claim 9, further including:

25 a plate having a pair of apertures therein, each aperture surrounding one of the biasing members.

27. The pressure regulator of claim 16, further including:

30 a plate having a pair of apertures therein, each aperture surrounding one of the biasing members.